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(54) Abstract Title
Marrow space awl

(57) A marrow space awl device for opening the hone during thigh nailing, with a guide, fitted with a handle and an awl fitted with an actuating handle and with a working point, the guide being formed by an angled plate, which is located at the end of the guide tool opposite the handle, and the angled plate has in one arm a guide bore, an anchor point being provided at the side of the other arm facing the body.

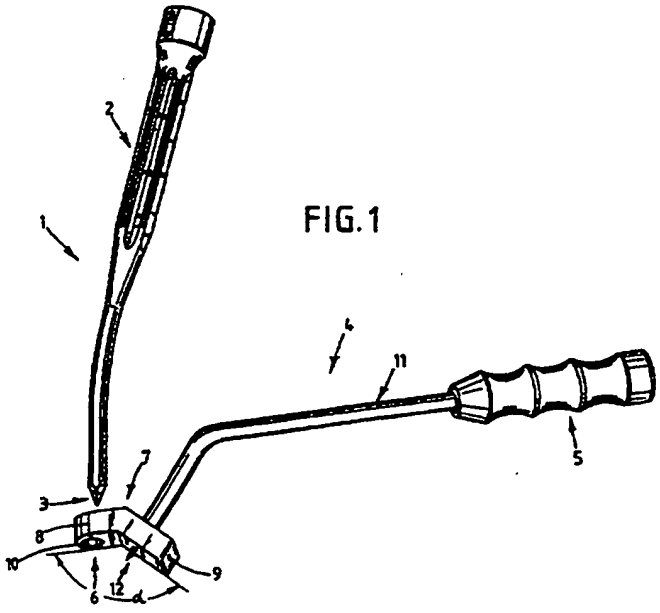

FIG.1

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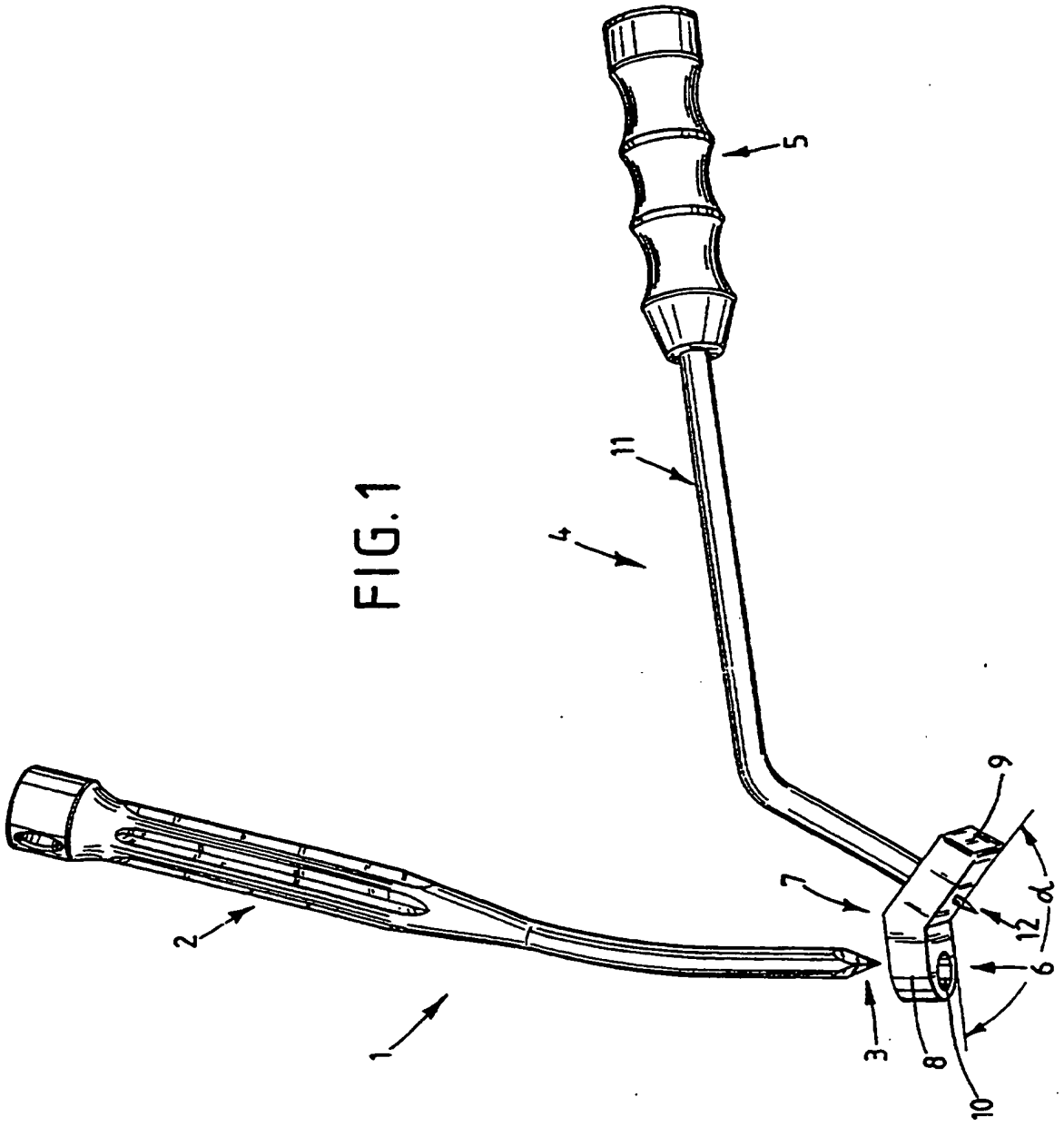
FIG.1



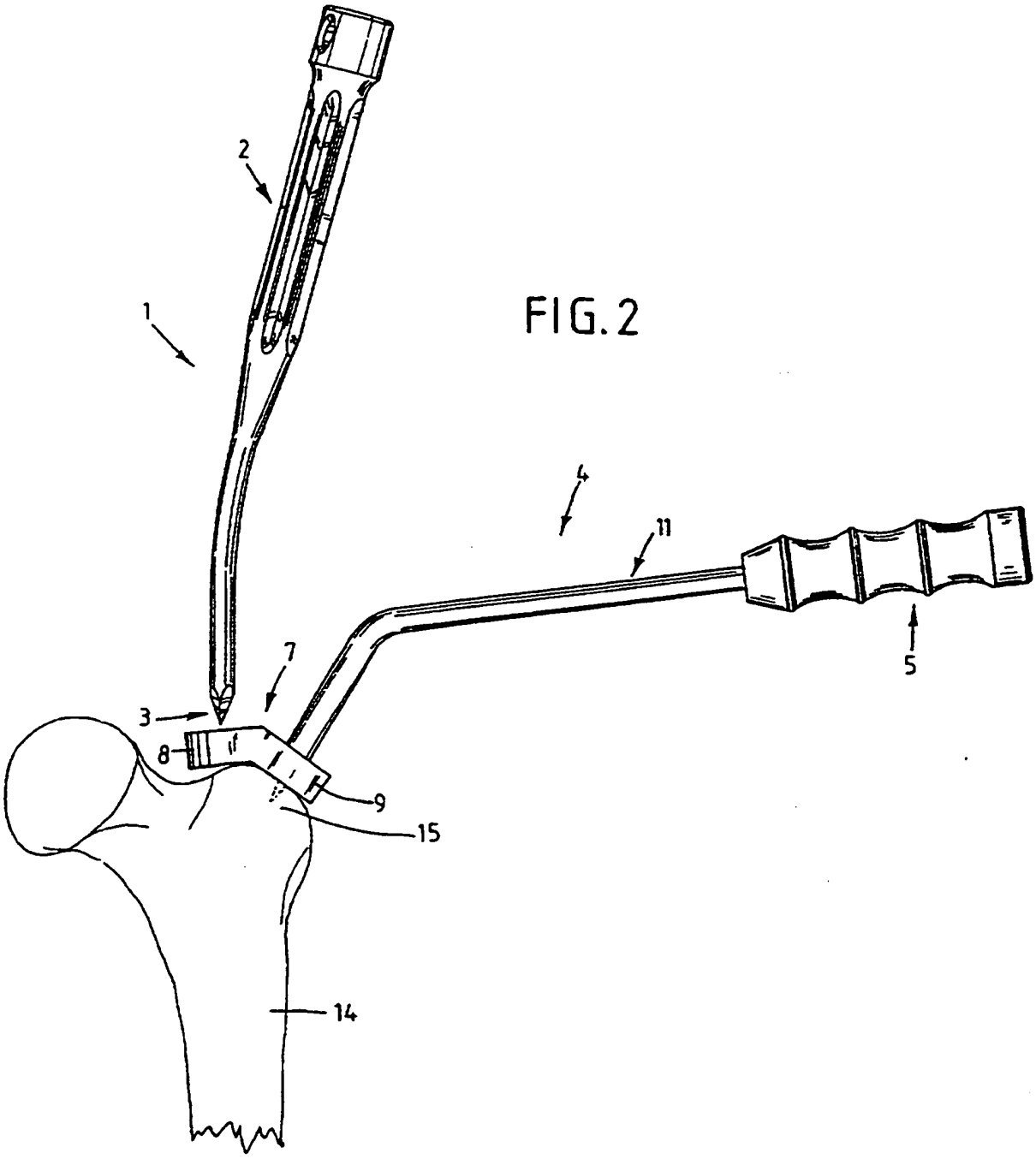


FIG. 2

"Marrow space awl device for preparing a thigh nail"

The invention relates to a marrow space awl device for opening the bone during nailing of the thigh according to the preamble of the main claim.

Marrow space awls are known and serve to open the bone in order to enable marrow nailing to be subsequently undertaken, in which a non-rusting steel nail with a, for example, cloverleaf- or U-shaped cross-section can be inserted into the marrow cavity under X-Ray monitoring when a long tubular bone is fractured. The marrow cavity or marrow tube is opened before insertion of the nail by means of a drill, which makes it necessary for the bone itself to receive a corresponding opening via an awl, a guide wire for guiding the marrow space drill being insertable through this opening. The bone is normally opened flush with the marrow tube in the area of the fona between the small and large terminal processes.

In the generic document DE-U 89 14 852, a marrow space awl is described which consists of two tools, i.e. on the one hand an actual awl, and on the other hand a guide tool, the guide tool having a receiving case, through which the working point of the marrow space awl can be

guided. The receiving case is thus introduced together with the point of the marrow space awl through the bone wall into the cavity beneath the bone wall and, after removal of the marrow space awl from the opening produced thereby, it can remain in place, so that in this way the musculature does not close the opening again. This enables simple introduction of the guide wire for the marrow space drill. A problem in the known tools resides in the fact that precise alignment of the actual guide for the working point of the marrow space awl is difficult, as the marrow space awl must penetrate the bone precisely in the longitudinal axis of the marrow cavity, in order thus to obtain guidance flush with the marrow space for the guide wire and the marrow space drill and the marrow nail.

The object underlying the invention is to improve the actual guidance for the working point for the marrow space awl in such a way that simple centering and alignment of the guide opening is possible with the aid of an X-Ray image, the centred position, once set, being reliably maintained.

According to the present invention there is provided a marrow space awl device for opening the bone during nailing of the thigh, comprising a guide, a guide tool

having a handle, and an awl having a handle and a working point characterised in that

a) the guide is formed by an angled plate, which is located on the end of the guide tool remote from or lying opposite the handle,

b) that the angled plate has a guide bore in one arm,

c) in that at least one anchor point is provided at the side of the other arm facing the body.

Further preferred and advantageous developments are given in the dependent claims.

In other words, an auxiliary means is proposed by means of which guidance of the working point of the marrow space awl on the small supporting process is reinforced, rotary movements or rotary settings of this guidance system flush with the marrow cavity being subsequently possible. If the guide is correspondingly aligned, by means of deeper penetration of the anchor point and the further friction thus achieved between the inner side of the angled plates and the outer side of the bone, the guide can be fixed, while now the awl may be driven simply with its working point by an assistant into the bone. In this respect it is important that the stem of the guide tool is located flush with the longitudinal

axis of the anchoring point on the underside of the angle plate, so that no pivotal movements are possible between the blocked anchor point and the point of engagement of the stem of the guide tool, but only rotary movement about the anchor point serving as an axis.

Whereas the invention has been explained in the foregoing with reference to the example of one anchor point, it is within the scope of the invention to provide a plurality of anchor points. In this case the central anchor point is preferably aligned flush with the stem of the guide tool and is further preferably longer in design than the other anchor point, so that despite the use of a plurality of anchor points, simple rotation after temporary fixing is possible, but then by means of further insertion, a better fixing of the working apparatus is achieved.

The angle defined or enclosed by both arms of the guide system preferably comes to 135°, and thus adapts ideally to the outer contour of the smaller terminal process.

An embodiment of the invention given by way of example will be explained in the following with reference to the accompanying drawings, in which:-

Fig 1: is a perspective view of the device of the invention and illustrating both the working tools forming the marrow space awl;

Fig 2: is a perspective view of the device of Fig. 1 in a position of use according to the invention on the small terminal process of a thigh bone.

In the drawings, Fig. 1 shows the two tools forming the actual marrow space awl, one being the actual awl 1, which has an actuating handle 2 and a working point 3. A guide tool 4 has a handle 5, and a stem 11 connected to the handle 5, and a guide 6 is provided at the lower end of the stem 11 and is in the form of an angled plate 7.

As is more clearly seen from Fig. 2, the angled plate 7 of guide 6 has two arms 8 and 9, which are located at an angle to each other, and at their side facing the body enclose or define an angle α of about 135°. The stem 11 of the guide tool 4 engages on the upper side of the arm 9, and on the side of the arm 9 facing the body there is located an anchor point 12, whose longitudinal axis is flush with the longitudinal axis of the connecting stem 11 of the guide tool 4.

Provided in the arm 8 of the angled plate 7 is a guide bore 10, which is adapted in size to the working point 3 of the awl 1.

Without going beyond the scope of the invention it is self-evidently possible to use the working point 3 together with a receiving case, so that closure of the opening formed by the working point 3 by means of contracting muscles is prevented.

Fig. 3 shows schematically the use of the guide tool 4 on a thigh bone 14. In this case, the angled plate 7 is applied to the outer side of the small terminal process 15, being fixed in its position by the anchor point 12 on the outer side of the small terminal process 15. Despite this fixture, rotary movements about the axis of the anchor point 12 are possible, in order in this way to enable precise alignment of the opening to be produced by the anchor point of the awl 1 without displacement of the actual angled plate 7. In this way a flush arrangement of the opening with the marrow cavity is possible without difficulty with an X-Ray image converter.

Claims

1. Marrow space awl device for opening the bone during nailing of the thigh, comprising a guide (6), a guide tool (4) having a handle (5), and an awl (1) having a handle (2) and a working point (3)
characterised in that
a) the guide (6) is formed by an angled plate (7), which is located on the end of the guide tool (4) remote from or lying opposite the handle (5),
b) that the angled plate (7) has a guide bore (10) in one arm (8),
c) in that at least one anchor point (12) is provided at the side of the other arm (9) facing the body.

2. Marrow space awl device according to claim 1, characterised in that only one anchor point (12) is provided.

3. Marrow space awl device according to claim 1 or 2, characterised in that the stem (11) of the guide tool (4) engages in a flush manner on the upper side of the arm (9), with the central axis of the anchor point (12).

4. Marrow space awl device according to claim 1, characterised in that both arms (8,9) of the angled plate (7) define or enclose an angle (α) of about 135°.

5. Marrow space awl device according to claim 1, characterised in that when there are a plurality of anchor points (12), the central anchor point has a greater length.

6. Marrow space awl device for opening the bone during nailing of the thigh, substantially as hereinbefore described with reference to the accompanying drawings.

The Patent Office

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Claims searched:	1-6	**Date of search:**	11 August 1998

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.P): A5R (RECX)

Int Cl (Ed.6): A61B 17/16, 17/17

Other:

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
A	EP 0440991 A1	(ACUFEX) See column 7 line 57-column 8 line 51 & Figure 6	-

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.